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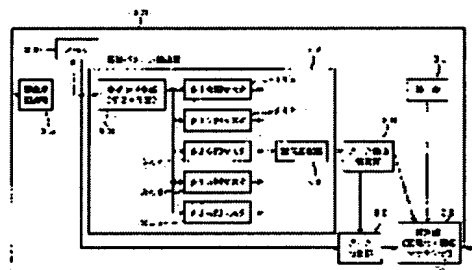
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(54) IMAGE PROCESSING METHOD, DEVICE THEREFOR AND PRINTER USING IT

(57)Abstract:

PROBLEM TO BE SOLVED: To allow an image processor to accurately discriminate whether or not an original is an output inhibited object even the image data does not give magnification information.

SOLUTION: A prescribed mark such as a circle mark whose diameter is 16mm is printed on an original that is an output inhibited object, and a mark of image data going to be outputted is compared with masks 34a-34e with a different marks, and a magnification estimate section 35 estimates a magnification given to a mask with a highest similarity degree (mask 34a: 110%, mask 34c: 100%, and mask 34e: 90%) to be a magnification of the image data. Based on the estimated magnification, a data extract section 29 extracts an image of a prescribed area, a discrimination section 30 normalizes the extracted data to be 100% and takes matching with reference data stored in a dictionary 31 so as to discriminate whether or not the data are an output inhibited object.



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**Bibliography**

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**Epitome**

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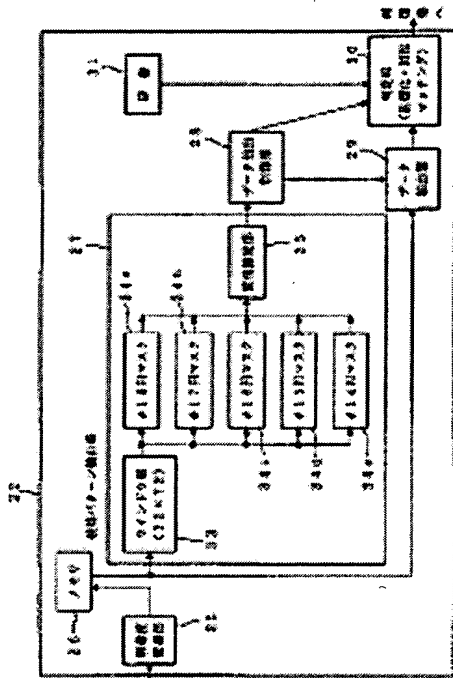
(57) [Abstract] (Modified)

[Technical problem] Even if it is the image data to which the rate information of variable power is not given, it can judge correctly whether it is an output prohibition object.

[Means for Solution] the image data which is going to print and output a predetermined mark, for example, a yen symbol with a diameter of 16mm, to the manuscript of an output prohibition object -- a mark -- the masks 34a-34e of a path are compared, and the rate of variable power (mask 34a:110%, mask 34c:100%, mask 34e:90%) most given to the high mask of whenever [ coincidence ] is presumed to be the rate of variable power of the image data in the variable power presumption section 35. It judges whether it is an output prohibition object by extracting the image of a predetermined field in the data extraction section 29, normalizing the data extracted in the judgment section 30 to 100%, and taking the criteria data and matching which were memorized by the dictionary 31 based on the presumed rate of variable power.

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CLAIMS

[Claim(s)]

[Claim 1] The image-processing approach characterized by presuming the rate of variable power of said image data outputted from the magnitude of the mark, and taking matching with criteria data to said image data based on said rate of variable power while detecting the predetermined mark which exists in the image data which it is going to output with image formation equipment.

[Claim 2] Matching performed based on said rate of variable power is the image-processing approach according to claim 1 characterized by normalizing after extracting the predetermined field in said image data to the rate of criteria variable power which constitutes criteria data based on said presumed rate of variable power, and taking matching with the data which normalized and said criteria data.

[Claim 3] The image-processing approach according to claim 1 characterized by preparing two or more kinds of criteria data according to a different rate of variable power, choosing said criteria data used out of a class based on said presumed rate of variable power, and taking matching with the selected criteria data and said image data. [ two or more ]

[Claim 4] The image processing system characterized by to have a mark-detection means

detect the predetermined mark which exists in the image data which it is going to output with image-formation equipment, a variable-power presumption means presume the rate of variable power of said image data from the magnitude of the mark detected with said mark-detection means, and a matching means take matching with criteria data to said image data based on the rate of variable power presumed with said variable-power presumption means.

[Claim 5] It has further the dictionary which remembered the criteria data corresponding to the rate of criteria variable power to be a field extract means to extract the predetermined field in said image data. While normalizing to said rate of criteria variable power to the field extracted with said field extract means based on said presumed rate of variable power, said matching means The image processing system according to claim 4 characterized by taking matching with the data which normalized, and the criteria data stored in said dictionary.

[Claim 6] The image processing system according to claim 4 characterized by to have further the dictionary which memorized the criteria data according to a different rate of variable power from a field extract means extract the predetermined field in said image data, and for said matching means to choose said criteria data used out of a class based on said presumed rate of variable power, and to take matching with the selected criteria data and said image data. [ two or more ]

[Claim 7] A means by which said mark detection means sets up the window of predetermined magnitude, The image data in the field from which it has two or more masks of the configuration corresponding to said predetermined mark based on two or more rates of variable power, and said variable power presumption means was extracted in said window, An image processing system given in any 1 term of claims 4-6 characterized by being what compares said two or more masks and asks for the rate of variable power based on the comparison result.

[Claim 8] Based on the given image data, carry out image formation, and while carrying the image processing system shown in any 1 term of said claims 4-7 in the printer equipped with an image formation means to output It is made to make said image processing system input said image data into said image formation means and juxtaposition. And said image processing system The printer characterized by performing output prohibition processing when it is made to output the information about whether the image data under processing is a detection object and image data is recognized as a detection object from the outputted information.

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**DETAILED DESCRIPTION**

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Even if this invention is a case with the unknown rate of variable power of the image which it is more specifically going to output to the image-processing approach and an equipment list actually about the printer which used it (rate of variable power to a manuscript), it relates to what can perform matching with a reference pattern correctly.

[0002]

[Description of the Prior Art] The faithful copy which the image quality of a copy image reaches even the level which cannot be distinguished in a subject-copy image and a naked eye, and is applied by development of image formation equipments, such as a full colour copying machine in recent years, came to be obtained easily. Although the original copy of a bill, negotiable securities, etc. is socially forbidden in connection with it, it is necessary to think that the danger of being abused for forgery increases, and the forged arrester for preventing beforehand the danger of starting is developed variously (for example, image processing system indicated by JP,2-210481,A).

[0003] And the equipment of these various kinds registers the image about copy prohibition objects, such as a bill, beforehand, and carries out the recognition judging (various the concrete recognition technique is developed and differs) of whether the image applied into an input image is contained. And when the image to apply has been recognized, various copy prohibition means, such as smearing away the whole copy paper surface black, and outputting it, or suspending the copy processing itself, are taken.

[0004] By the way, since it is a principle to carry out the copy output of the body (manuscript) laid on the manuscript base except for copy prohibition objects, such as a bill, for the predetermined scale factor as full size faithfully, when the image (bill not but also legally image which can be copy) which resembled the bill temporarily is input, a copying machine needs to recognize it as it not be a bill, and needs to perform the usual copy processing as it is. Therefore, whenever [ coincidence / at the time of performing a recognition judging ] (threshold of a criterion) will become high inevitably.

[0005] Then, since the magnitude (configuration) of the image data given to an image processing system from the body side of a copying machine differs from the thing of the criteria data (actual size: 100% of rates of variable power) registered beforehand when it reduces or expands by the variable power function of a copying machine and copy processing is carried out, whenever [ coincidence ] falls and there is a possibility that it may be recognized as it not being a bill.

[0006] and -- the bill of the foreign country is unclear when only that (magnitude -- differing) by which the forged copy was carried out is seen alone, furthermore have not got it used to seeing usually although it understands immediately since the magnitude differs if the deflection of the rate of variable power contrasts a real bill and directly and compares at several % - about about ten% -- still more -- \*\* -- it becomes.

[0007] Then, two or more sorts of reference patterns for example, according to each rate of variable power are prepared as equipment for corresponding to the variable power which starts conventionally, the rate information of variable power is acquired from the body of a copying machine at the time of actual copy processing, and there are some which were made to carry out matching processing based on the reference pattern according to the acquired rate of variable power.

[0008] Moreover, as shown in JP,6-237379,A, based on the rate information of variable power, carry out infanticide processing to image data (the number which thins out the thing which has a large dilation ratio is increased), the image after thinning out is made to become fixed magnitude, and there are some which aimed at matching with the image after the infanticide and a reference pattern. What is necessary is just coming to also prepare one kind of reference pattern, since this becomes fixed regardless of the magnitude of the image for a comparison (after thinning out) at the rate of variable power. And he thins out and is trying to generate the infanticide pattern at the time of processing using the shift register of a round mold.

[0009] A possibility that a bill, negotiable securities, etc. may be forged comes out by outputting the image data which stored it in the memory in a personal computer in connection with the resolution of a printer having also improved recently, and having connected with computers, such as a personal computer, and it on the other hand, and the resolution of a scanner having improved while reading the bill etc. with the scanner, and was stored in the starting memory after that to a printer. Then, the need of taking the cure to forgery etc. also about the printer used as the equipment which finally carries out image formation and outputs a forged object came out.

[0010]

[Problem(s) to be Solved by the Invention] However, in the case of the above-mentioned printer,

the image processing system for forged prevention in the copying machine with which the countermeasures of the conventional various kinds are taken is inapplicable as it is from the various reasons shown below.

[0011] Namely, since the image formation section 2 which forms and outputs the read station 1 which reads a manuscript as shown in drawing 1 , and the read image in the case of a copying machine is incorporated in the same equipment, In carrying out copy processing, it reads the manuscript first set on the manuscript base by the read station 1. When recognition processing predetermined on delivery and real time is performed in the recognition section 3 with the image formation section 2 and the manuscript has recognized the read image data to be specific manuscripts, such as a copy prohibition object, the above-mentioned predetermined copy prohibition processing is performed. In addition, actuation of each part is controlled by the control section 4.

[0012] And when forging using the copying machine to apply, it is almost the case that the "genuine article" about the candidate for forged is put on a manuscript base. And since image formation is carried out, it outputs and the information on to what% it expanded / reduced whether variable power processing of whether it copied by actual size was carried out again in the case of variable power also understands the control section 4 of the body of a copying machine while reading, as described above Being able to carry out recognition processing according to a scale factor, when the recognition section 3 acquires the starting information from a control section 4, recognition becomes possible [ carrying out by being easy and highly precise ].

[0013] However, in the case of a printer, although the image data to output is already stored in memory, such as a computer, since it is not understood whether the image is in what% of condition to the original manuscript, as described above, it cannot recognize that a predetermined image is during output processing by recognition processing corresponding to variable power.

[0014] On the other hand, since a printer is final output equipment in a forged action, if a formed object (image outputted) is not in a condition with difficult genuine article and discernment, even if it will not forbid an output, there is no actual harm. Therefore, what is necessary is to recognize that discernment is outputted by the difficult delicate variable power which is 90% - about 110%, for example, and just to be able to forbid an output, if it glances.

[0015] Therefore, in addition to the recognition processing section corresponding to 100%, two or more recognition processing sections corresponding to N % (N is the numeric value of the arbitration of 90-110 within the limits) are prepared. By carrying out recognition processing to the image data which it is going to output using the recognition processing section of these plurality, respectively, and judging a recognition processing result integrative It judges whether it is the image which should carry out output prohibition, and, in the case of a prohibition image, it is possible to constitute so that predetermined output prohibition processing may be carried out like a copying machine.

[0016] However, carrying out multiple-times recognition processing using the one recognition processing section, changing a recognition algorithm requires time amount too much, and the processing of it on real time becomes impossible. Constructing a circuit so that only the number of the classes of rate (N %) of variable power which carries out recognition processing may prepare the recognition processing section and may carry out parallel processing in each recognition processing section on the other hand to the image data which it is going to output is also considered. If it is made the starting configuration, time amount which recognition processing takes can be performed similarly to a single thing. However, supposing the recognition section 3 corresponding to one kind of rate of variable power (actual size) has composition like drawing 2 , recognition section 3' corresponding to the starting variable power will come to be shown in drawing 3 , and circuitry will enlarge it, and it will cause cost quantity.

[0017] That is, when only actual size is taken into consideration, the recognition section 3 equips an input side with the resolution transducer 5, and he is trying to form the image which dropped the resolution of input image data on low predetermined resolution, and obscured it like drawing 2 . And while becoming strong in a printing gap or a noise by carrying out recognition processing



based on the image data obscured such, it is made to carry out recognition processing to a high speed on a scale of a small circuit. Moreover, the image data of the applied resolution which was obscured is once stored in memory 6. To the image data of the predetermined field stored in the memory 6, carry out pattern matching in the candidate pattern extract section 7, and a candidate pattern appropriate [ specific ] is extracted. When a candidate pattern is detected, information (a detecting signal, positional information, etc.) required for the data extraction control section 8 in delivery and the data extraction section 9 The image data of the predetermined field which made a note based on the extract signal from the data extraction control section 8, and was stored in 6 is extracted, and the image data extracted (logging) is given to the judgment section 10 of the next step. In the judgment section 10, matching with the reference pattern stored in the dictionary 11 is taken, and when it judges whether it is a specific pattern and judges it as a specific pattern, a detecting signal is outputted.

[0018] On the other hand, since the magnitude of the specific pattern which should be recognized differs in order to make it variable power correspondence As shown in drawing 3, each rate of variable power is received., respectively The candidate pattern extract sections 7a-7e, The data candidate extract control sections 8a-8e, the data extraction sections 9a-9e, and the integrated section 12 that the judgment sections 10a-10e and Dictionaries 11a-11e are needed, synthesizes the judgment result of each judgment sections 10a-10e further, and makes a final judgment are also needed. Thus, a circuit scale is enlarged. In addition, in the example of illustration, in order to clarify contrast with the gestalt of operation of this invention, it wrote corresponding to five kinds of rates of variable power for convenience as a premise, but in order to carry out finer variable power correspondence, when the number of each part is increased, the starting problem will appear more notably.

[0019] Furthermore, since the rate of variable power of the output image to a real manuscript is unknown, in any case, it is necessary to give the recognition result in each rate (N %) of variable power to the integrated section 12, and it needs to carry out judgment processing synthetically. and since one thing with which the rate of variable power agreed among the recognition results give is whether to be or not, since the information ( a recognition result ) from a different thing start is also use for a judgment ingredient unlike the rate of actual image data of variable power, a possibility that recognize with a specific manuscript to breadth and the image formation action which is not forgery ( incorrect recognition : it see too much ), and the recognition range may carry out output prohibition processing is in many recognition results.

[0020] The place which this invention was made in view of the above-mentioned background, and makes into the purpose solves the above-mentioned problem, structure is simple, recognition processing on real time can perform, a possibility may moreover incorrect - recognize controls as much as possible, the image which should forbid carries out output prohibition, and it is for the usual image offer the printer which used it for the image processing approach and the equipment list which can permit an output.

[0021]

[Means for Solving the Problem] By the image-processing approach concerning this invention, in order to attain the above-mentioned purpose, while detecting the predetermined mark which exists in the image data which it is going to output with image formation equipment, the rate of variable power of said image data outputted from the magnitude of the mark is presumed, and matching with criteria data was taken to said image data based on said rate of variable power (claim 1).

[0022] Here, a predetermined mark corresponds to the circle pattern part P1 with the gestalt of operation. And although some specific patterns were used also [ mark / predetermined ] with the gestalt of operation, even if this invention prepares separately the mark which was suitable since it did not restrict to this and the rate of variable power was specified with a specific pattern and detects it, it is easy to be natural [ this invention ].

[0023] Moreover, "the rate of variable power" as used in the field of this invention means the rate of variable power of the image to a genuine article (manuscript) which it is finally going to output. Therefore, it does not ask whether deformation processing to an image is performed by the middle.

[0024] Matching performed based on said rate of variable power is normalized after extracting the predetermined field in said image data to the rate of criteria variable power which constitutes criteria data based on said presumed rate of variable power, for example, and matching with the data which normalized and said criteria data can be taken (claim 2). Moreover, two or more kinds of criteria data according to a different rate of variable power are prepared, said criteria data used out of a class are chosen based on said presumed rate of variable power, and matching with the selected criteria data and said image data can be taken (claim 3). [ two or more ]

[0025] and as equipment suitable for enforcing the above-mentioned approach A mark detection means to detect the predetermined mark which exists in the image data which it is going to output with image formation equipment (constituted from the gestalt of operation by a window 33 and Masks 34a-34e), A variable power presumption means to presume the rate of variable power of said image data from the magnitude of the mark detected with said mark detection means, A matching means (with the gestalt of operation, it corresponds to the judgment section etc.) to take matching with criteria data to said image data based on the rate of variable power presumed with said variable power presumption means was had and constituted (claim 4).

[0026] In addition, the matching processing in a matching means extracts pattern-matching template matching and characteristic quantity, and can perform various kinds of processings besides being as compared with it etc., and what is generally called recognition processing etc. includes it.

[0027] Moreover, a field extract means to extract the predetermined field in said image data (with the gestalt of operation, it corresponds to the data extraction section), While it has further the dictionary which memorized the criteria data corresponding to the rate of criteria variable power and said matching means normalizes to said rate of criteria variable power to the field extracted with said field extract means based on said presumed rate of variable power You may make it take matching with the data which normalized, and the criteria data stored in said dictionary (claim 5). Although this concrete configuration explains to a detail with the gestalt of operation shown in drawing 5 and makes the rate of criteria variable power 100% with the gestalt of operation, it does not restrict to that value.

[0028] Moreover, it has further the dictionary which memorized the criteria data according to a different rate of variable power from a field extract means to extract the predetermined field in said image data, said matching means chooses said criteria data used out of a class based on said presumed rate of variable power, and you may make it take matching with the selected criteria data and said image data (claim 6). [ two or more ] This number is also arbitrary, although this concrete configuration explained with the gestalt of operation shown in drawing 12 and prepared five kinds of dictionaries with the gestalt of that operation. And although the number of masks and the number of dictionaries are made equal, it is not necessary to make it equal in this way, and you may differ in this invention. When becoming beyond the class of mask as a mask is made into five kinds and the rate of variable power presumed using the mask explained in the modification if an example is shown (for example, it judges synthetically and the middle rate of variable power of the rate of variable power of a mask is also called for), you may make it have a dictionary more than the number of masks corresponding to the class of the rate of variable power.

[0029] On the other hand, said mark detection means has a means to set up the window of predetermined magnitude, and two or more masks of the configuration corresponding to said predetermined mark based on two or more rates of variable power, said variable power presumption means compares with said two or more masks the image data in the field extracted in said window, and you may make it ask for the rate of variable power based on the comparison result (claim 7).

[0030] In addition, although the rate of variable power of the mask of whenever [ maximum coincidence ] was presumed to be the rate of variable power of image data with the gestalt of operation, saying "it asks for the rate of variable power based on a comparison result", this invention judges synthetically the result which did not restrict to it and was obtained with the predetermined mask, and you may make it ask for the rate of variable power.

[0031] In this invention, a predetermined mark is detected and, in the case of the magnitude at

the time of the rate 100 of variable power, the magnitude can also presume the rate of variable power of the image data of a processing object to be 100%. Moreover, when the magnitude of a predetermined mark is smaller than the thing of actual size, it can presume that it is reduced and the rate of variable power of how much to have been reduced from the concrete magnitude is also known. Conversely, it can presume that it is expanded, when the magnitude of a predetermined mark is larger than the thing of actual size, and the rate of variable power can also be presumed. So, in this invention, a predetermined mark is detected based on the starting principle, and the rate of variable power of the image data which it is going to output based on the magnitude is presumed.

[0032] and -- while the area (magnitude) which carries out a field extract, for example since the magnitude of a specific pattern is also known, if the rate of variable power is able to be presumed such, and the recognition algorithm which use since it can set up almost the neither more nor less and the rate of variable power also understands comparison and recognition / judgment processing with criteria data can be managed with one, and possibility that unnecessary information will enter can control them as much as possible and being able to detect a specific pattern certainly -- incorrect detection - seeing -- passing -- \*\* -- there is nothing in things.

[0033] Furthermore, if the rate of variable power is known, by normalizing to the predetermined rate of variable power, the classes of criteria data can be reduced and memory space can be reduced so that it may specify, for example to claims 2 and 5. Moreover, although the amount of the part memory used increases like claims 3 and 6 when it has two or more kinds of criteria data, since the rate of variable power is known, it ends with one, and as shown in drawing 3 , integrated processing becomes unnecessary, and precision of criteria data actually used increases.

[0034] Moreover, while carrying the image processing system shown in any 1 term of said claims 4-7 in the printer equipped with an image formation means to carry out image formation by the printer of this invention based on the given image data, and to output It is made to make said image processing system input said image data into said image formation means and juxtaposition. And said image processing system It is made to output the information about whether the image data under processing is a detection object, and when image data was recognized as a detection object from the outputted information, it was made to perform output prohibition processing (claim 8).

[0035] By making it the starting configuration, it judges whether it is what the rate information of variable power on the image data which it is going to output may not be given, or may presume the rate of variable power at internal processing, and may be outputted, and in the case of an output prohibition object, predetermined output prohibition processing can be performed, and forgery etc. can be beforehand prevented to it.

[0036]

[Embodiment of the Invention] Drawing 4 shows an example of the gestalt of operation of the printer of this invention. As shown in this drawing, it has the image formation section 20 which uses as reception the image data given from external devices, such as a personal computer, uses image formation of the image data to a predetermined form, and is outputted. Since the configuration which performs predetermined printing processing and starts in response to the control signal from a control section 21 is fundamentally the same, this image formation section 20 abbreviates detailed explanation of each part to the conventional printer.

[0037] By this invention, the image data given to the image formation section 20 is also given to the recognition section 22 in juxtaposition, and when it has been recognized as whether the specific pattern exists in image data in the recognition section 22, and it judging and existing, predetermined output prohibition processing is performed to the image formation section 20 here through a control section 21. As this output prohibition processing, the output itself may be suspended, the whole image or a part may be smeared away by the color of black and others, or a predetermined mark and predetermined alphabetic characters (for example, a "sample", a "counterpart", etc.) may be printed in piles.

[0038] And if an example of the internal configuration of the recognition section 22 is shown, it

has become like drawing 5 . First, when a specific pattern (pattern which consists of an asterisk P2 which exists in a circle P1 and its circle) as shown in drawing 6 which exists in an output image is detected and there is a specific pattern to apply, he is trying to recognize it as an output prohibition object in this example.

[0039] And the recognition section 22 equips an input side with the resolution transducer 25, and he is trying to form the image which dropped the resolution of input image data on low predetermined resolution, and obscured it. If an example is shown, since being given in 600DPI is [ as for image data ] common in the case of a printer, he is trying to drop it on 100DPI.

[0040] And while becoming strong in a printing gap or a noise by carrying out recognition processing based on the image data obscured such, recognition processing can be carried out to a high speed on a scale of a small circuit. Moreover, by the image after conversion (100% of rates of variable power), as a specific pattern shows drawing 6 by changing into 100DPI in this way, when a diameter sets to 16mm, as shown in drawing 7 , a diameter will be expressed by 64 dots. Moreover, in case resolution conversion is carried out in these 100DPI, it may be made to carry out binarization processing.

[0041] And the image data of the resolution obscured in this way is once stored in memory 26. The candidate pattern extract section 27 and the data extraction section 29 are connected to memory 26, and an output of the image of predetermined area is possible to each. And the recognition processing in this gestalt receives the image data of the predetermined field stored in memory 26. When pattern matching is carried out in the candidate pattern extract section 27, a candidate pattern appropriate [ specific ] is extracted and a candidate pattern is detected Information (a detecting signal, positional information, etc.) required for the data extraction control section 28 in delivery and the data extraction section 29 The image data of the predetermined field which made a note based on the extract signal from the data extraction control section 28, and was stored in 26 is extracted, and the image data extracted (logging) is given to the judgment section 30 of the next step. In the judgment section 30, matching with the reference pattern stored in the dictionary 31 is taken, and when it judges whether it is a specific pattern and judges it as a specific pattern, a detecting signal is outputted. The flow of the starting processing is the same also with the equipment of drawing 2 which omitted concrete explanation.

[0042] It faces performing extract processing in the candidate pattern extract section 27, the rate of variable power to the original manuscript of the image data under processing is presumed, and he also combines variable power information, and is trying to output by this invention here. That is, by this example, the circle pattern part P1 which can detect easily comparatively among specific patterns is detected, when there is it, it considers as those with a candidate pattern, and the data of the interior containing the pattern part P1 are cut down, and it is made to carry out judgment processing in the candidate pattern extract section 27. That is, the circle pattern part P1 corresponds to the predetermined mark for presuming the rate of variable power in this invention.

[0043] Therefore, if the image data for recognition considers as actual size (100% of rates of variable power), the circle pattern part P1 will compute whenever [ circle coincidence ] at a rate of the pixel which was in agreement as compared with image data using the mask (the part applied by the drawing bullet is equivalent to the circle pattern part P1) as shown in drawing 8 . And when whenever [ circle coincidence ] becomes beyond a fixed value, it supposes that the circle pattern part P1 was detected, and it is based on judging with those with a candidate pattern.

[0044] Furthermore, by this example, since it corresponds to 90 - 110% of rates of variable power, in the case of 90% of rates of variable power, the diameter of a specific pattern becomes with about 14mm (56 dots), and, in the case of 110% of rates of variable power, the diameter of a specific pattern is set to about 18mm (72 dots).

[0045] Therefore, when the circle of 64 dots of diameters as a result of carrying out detection processing of the circle pattern part P1 is detected, since it is the magnitude of the mark which appears at the time of actual size, it can also presume image data to be actual size. moreover, when the circle of 56 dots of diameters as a result of carrying out detection processing of the

circle pattern part P1 is detected Since it is the magnitude of the mark which appears at the time of 90% of rates of variable power, the image data under processing can be presumed to be that by which variable power processing was made 90% to the original manuscript. When the circle of 72 dots of diameters as a result of carrying out detection processing of the circle pattern part P1 similarly is detected, it can be presumed to be that by which variable power processing was carried out to 110% of rates of variable power. Then, he is trying to presume the rate of variable power from the magnitude of the detected candidate pattern in this example, carrying out detection processing of a candidate pattern based on the starting principle.

[0046] Specifically, the candidate pattern extract section 27 consists of the window section 33, two or more kinds of masks 34a-34e, and the variable power presumption section 35. And the window section 33 extracts the image in the window area to the image data stored in memory 26 using the window of 72 dot around in order to enable an extract of the circle pattern part of 72 dots of an overall diameter.

[0047] Moreover, by 1mm unit, two or more kinds of masks 34a-34e write within the limits of the diameter of the circle pattern part described above in this example as detection is possible. So that it may illustrate The diameter of 18mm Five kinds of circle mask 34e circle mask 34d circle mask 34a of \*\*, circle mask 34b for diameter 17mm (105% of rates of variable power), circle mask 34c for diameter 16mm (actual size), and for diameter 15mm (95% of rates of variable power) and for diameter 14mm (90% of rates of variable power) are prepared. (110% of rates of variable power) Parallel connection was carried out to the window section 33.

[0048] This will cover five masks M1-M5 with which paths differ with concentric to the image data in the window W of 72x72 extracted in the window section 33, as shown in drawing 9 , and he is trying to send whenever [ circle coincidence / which asked for and asked for whenever / circle coincidence / , respectively ] to the variable power presumption section 35 with each masks 34a-34e.

[0049] When it is more than constant value, while the variable power presumption section 35 extracts the greatest thing among whenever [ circle coincidence / which was given ], and it judges with those with a candidate pattern, it specifies the mask used as whenever [ greatest circle coincidence / starting ], and he is trying to presume the rate of variable power of the image whose rate of variable power of the mask is under processing. And when a candidate pattern is detected such, the rate information of variable power is also outputted to the data extraction control section 28 with the detecting signal.

[0050] In the data extraction control section 28, as described above, when a candidate pattern is detected, while giving data (a main coordinate, its path, etc.) required in order to extract the interior of the detected circle pattern part P1, i.e., the mask used as whenever [ maximum circle coincidence ], to the data extraction section 29, the rate of variable power is sent also to the judgment section 30.

[0051] In the data extraction section 29, the field of the magnitude which suited the rate of variable power of the image which it is going to output will be extracted. That is, if it explains taking the case of drawing 9 , the pixel data which exist in the inside part (you may also include a periphery (circle pattern part) and it is good also as the inside) of the circle from which whenever [ circle coincidence ] became max among masks M1-M5 will be extracted, and it will come to send to the judgment section 30. By this, when [ which is extracted at 100% (immobilization) of rates of variable power ] it is made like (a part for 64 dots of diameters is extracted to the given main coordinate), are generated. As opposed to that whose rate of variable power is 110% cannot extract a periphery part or Conversely, since there is no possibility [ like ] of saying that the pixel data around a specific pattern will be extracted to the thing of 90% of rates of variable power beyond the need and a specific pattern part can be extracted the neither more nor less, the precision of subsequent judgment processing improves.

[0052] After performing the normalization to the image data (circle) sent from the data extraction section 29 based on the presumed rate of variable power, he is trying to take matching with the reference pattern stored in the dictionary 31 in the judgment section 30. That is, since the data about the reference pattern about 100% (actual size) of rates of variable power are registered into the dictionary 31 in this example, regardless of the rate of variable power

which it is actually going to output, it is normalized in the magnitude of 100% of rates of variable power. In addition, it normalizes to 100% for making it the reduction of area with actual image data become small, and it is good as for 90%, 110 etc.%, etc., and you may make it normalize it to the rate of variable power of the arbitration of further the range inside and outside.

[0053] And since judgment processing in the judgment section 30 is performed by rotation matching, it is made to perform normalization processing in radius. That is, when the rate of variable power is temporarily presumed to be 110%, the extracted image data serves as a circle with a diameter of 18mm, as shown in drawing 10 (A). Then, it normalizes in a circle of 100% (diameter of 16mm) of rates of variable power as show this in this drawing (B).

[0054] The radius of a circle with a diameter of 18mm becomes 36 dots, the radius of a circle with a diameter of 16mm is 32 dots, and the number of the differences is four. Although it may follow, for example, 4 dots may be thinned out simply, as shown in this drawing (C), by this example, the pixel located in a line with radial is quadrisected. Then, in the case of 18mm, one partition becomes 9 dots. On the other hand, in the case of 16mm, one partition becomes 8 dots. Therefore, he is trying to reduce 1 dot for every partition. And the array of black and white is before and after normalization, and he is trying for the normalization to also seldom change in consideration of the array of the pixel of 1 partition. When an example is shown and white has seven black [ two ] continuously, white can be carried out for black like one piece by seven pieces. And the starting transformation rule which normalize create the table which associated for example, conversion order, and can perform it with reference to the table at the time of normalization. Of course, it may be made to perform simple infanticide for every partition, and concrete processing of normalization can use various kinds of things.

[0055] Moreover, although an illustration abbreviation is carried out, since one partition becomes 7 dots, to 90% of case, a radius will complement with 28 dots by 1 dot for every partition. And the middle can respond by normalizing per 2 partitions.

[0056] And by putting it in order, while cutting down radial pixel data the whole predetermined include angle (for example, 6 times spacing) from the criteria include angle (0 times) of arbitration as shown in drawing 11 if it normalizes by making it such and the circle of 100% of reduction of area (32 dots of radii) is generated, as shown in this drawing (B), the pattern for strip-of-paper-like matching is generated. And he judges whether it is a specific pattern and is trying to output a detecting signal at a control section by comparing the matching pattern and criteria data and asking for whenever [ coincidence ] in the case of a specific pattern. In addition, it is easy to be natural even if it is made to make a judgment of being a specific pattern final only by asking for whenever [ coincidence ] (similarity) by the control-section side.

[0057] Since what is necessary is just to also perform recognition processing (matching) in the judgment section 30 based on one kind of rate of variable power while being able to start a specific pattern part correctly and also being able to manage a dictionary with one kind (100% of rates [ The gestalt of operation ] of variable power), since the rate of variable power can be presumed by taking the above-mentioned configuration, memory space and a circuit scale are reduced and, moreover, the flux of light and exact recognition processing can be performed.

[0058] As structure of the recognition section, it does not restrict to the above-mentioned thing, for example, you may make it shown in drawing 12 . In this example, it is different from the above-mentioned gestalt of operation, and two or more dictionaries 31a-31e corresponding to the rate of variable power are prepared. And he is trying to choose the dictionary used as the comparison criteria at the time of performing judgment processing by judgment section 30' according to the rate of variable power presumed in the variable power presumption section 35. And in judgment section 30', the comparison (rotation matching) with the criteria data stored in the selected dictionary and the given image data is taken, and it asks for whenever [ coincidence ]. In addition, with this gestalt, it becomes unnecessary to normalize like the above-mentioned gestalt of operation, down stream processing is reduced, and a high speed and exact processing are attained more from choosing the dictionary of the same rate of variable power as image data. However, since two or more dictionaries are prepared, memory consumption is mostly needed. In addition, since the operation effectiveness is the same as the gestalt of operation shown at above-mentioned drawing 5 in other configuration lists, the

detailed explanation is omitted in them.

[0059] Although the above-mentioned gestalt of operation explained the example which prepared five kinds of circle masks, this invention may not be restricted to this and may be prepared.

[ much ] And more accurate recognition processing can be performed by creating the thing of the fine rate of variable power.

[0060] Moreover, although it was made the rate of variable power corresponding to the mask of whenever [ maximum circle coincidence ] with the above-mentioned gestalt when each presumed the rate of variable power, this invention judges synthetically the rate of variable power which did not restrict to this, for example, was called for with each mask, and you may make it ask for the rate of variable power. When starting, although it was discrete, the rate of variable power corresponding to a mask can perform various kinds of processings to the rate of variable power of the interstitial segment between the adjoining rates of variable power, and can perform recognition processing with a more sufficient precision. Since it can ask for the more exact rate of variable power while being able to reduce the number of masks if it is made the starting configuration, further improvement in a recognition rate can be aimed at.

[0061]

[Effect of the Invention] as mentioned above, by the printer which used it for the image-processing approach and equipment list concerning this invention Since the rate of variable power can be presumed even if the rate of variable power of the image data to output is not given By performing an image processing based on the presumed rate of variable power, with easy structure, moreover, recognition processing on real time can be performed, a possibility of incorrect-recognizing is controlled as much as possible, output prohibition of the image which should be forbidden can be carried out, and, as for the usual image, an output can be permitted.

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[Translation done.]

**\* NOTICES \***

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1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.\*\*\*\* shows the word which can not be translated.

3.In the drawings, any words are not translated.

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**DESCRIPTION OF DRAWINGS**

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the example which mounted the virtual processor (recognition section) in the conventional copying machine.

[Drawing 2] It is drawing showing an example of the internal configuration of the recognition section.

[Drawing 3] It is drawing explaining the conventional trouble.

[Drawing 4] It is drawing showing one gestalt of the printer concerning this invention.

[Drawing 5] It is drawing showing the internal structure of the recognition section.

[Drawing 6] It is drawing showing an example of a specific pattern.

[Drawing 7] It is drawing explaining the expression condition in the image of a specific pattern.

[Drawing 8] It is drawing showing an example of a mask.

[Drawing 9] It is drawing explaining an operation.

[Drawing 10] It is drawing explaining normalization.

[Drawing 11] It is drawing explaining rotation matching.

[Drawing 12] It is drawing showing another internal structure of the recognition section.

[Description of Notations]

20 Image Formation Section

22 22' Recognition section

29 Data Extraction Section (Field Extract Means)

30 30' Judgment section (matching means)

31, 33a-33e Dictionary

33 Window Section (Mark Detection Means)

33a-33e Circle mask (mark detection means)

35 Conversion Presumption Section (Variable Power Presumption Means)

[Translation done.]

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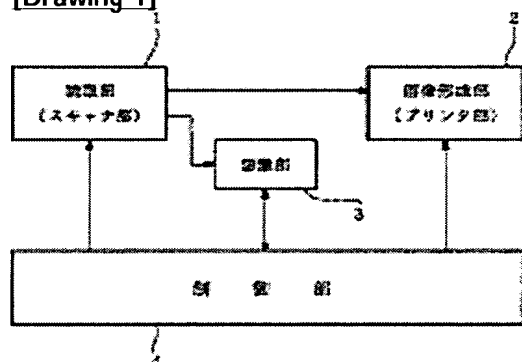
1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.\*\*\*\* shows the word which can not be translated.

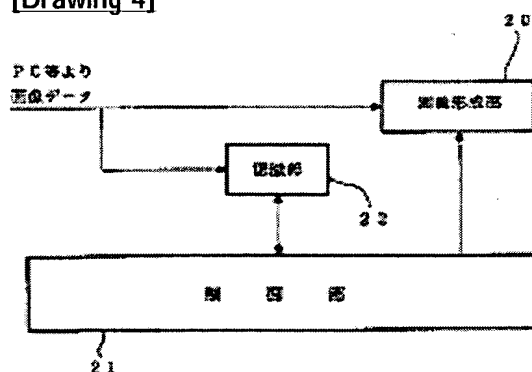
3.In the drawings, any words are not translated.

## DRAWINGS

[Drawing 1]

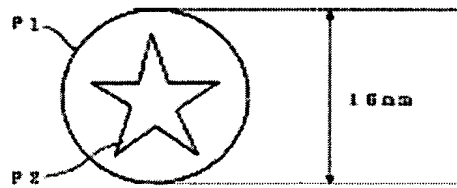


[Drawing 4]

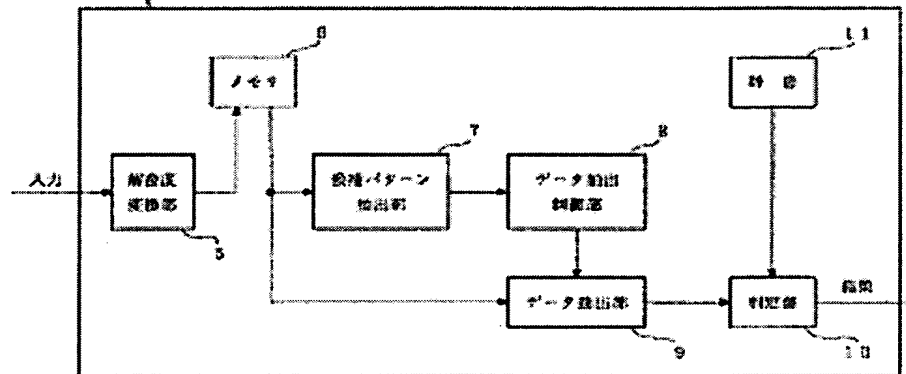


[Drawing 6]

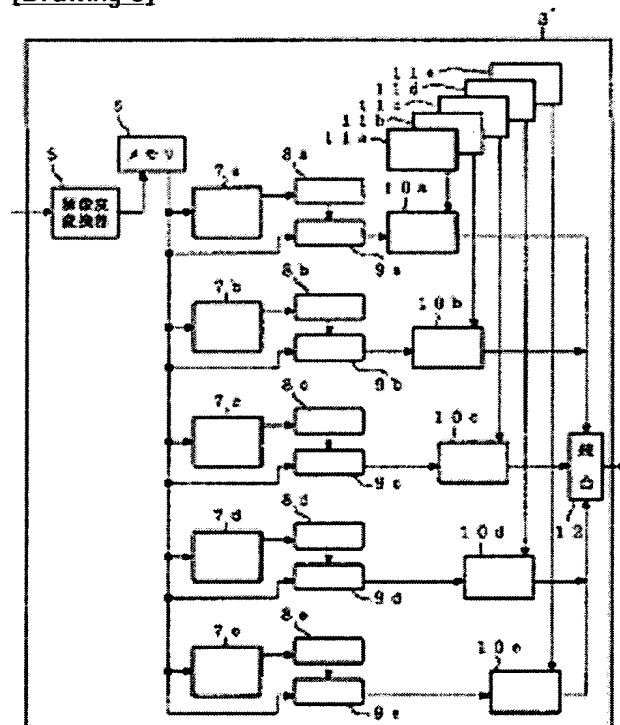




[Drawing 2]

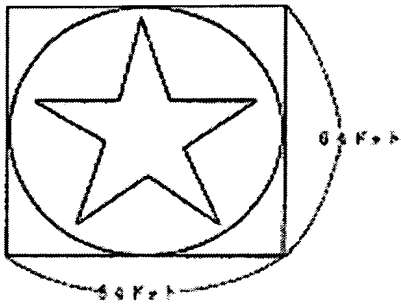


[Drawing 3]

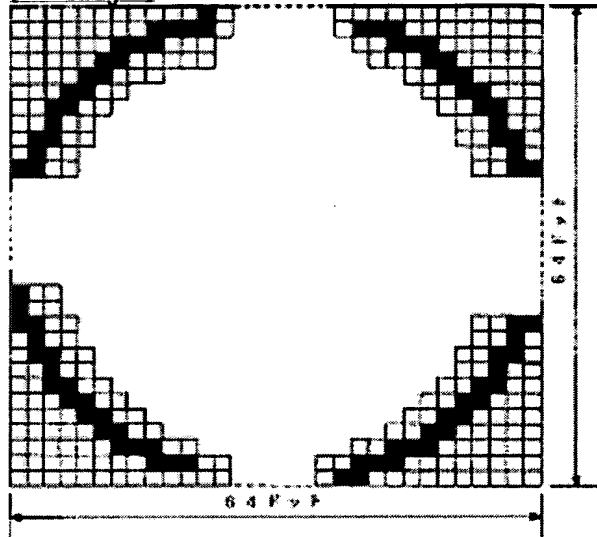


[Drawing 7]

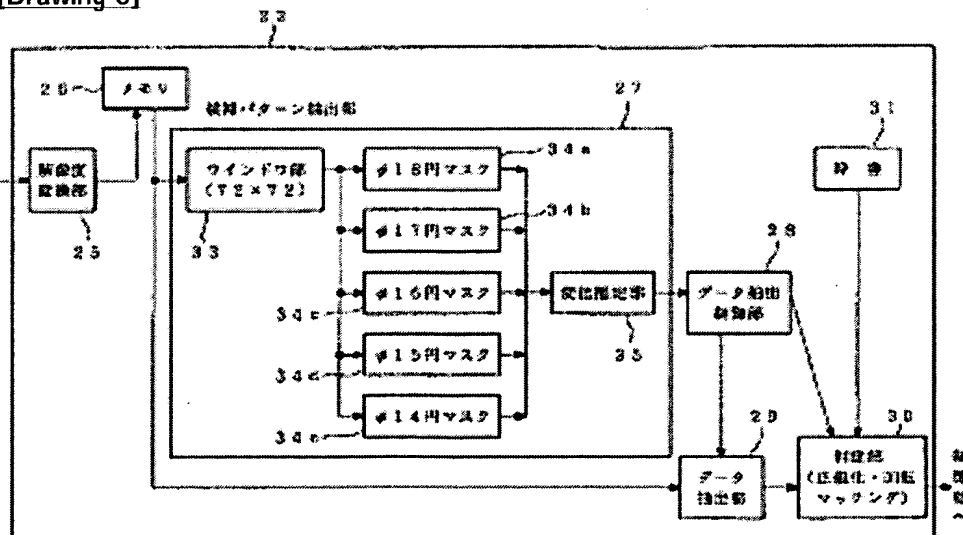
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[Drawing 8]

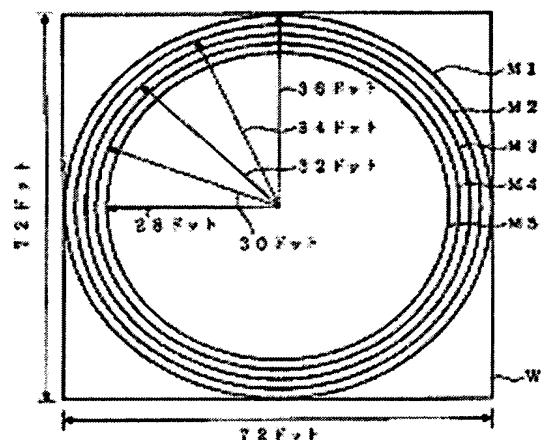


[Drawing 5]

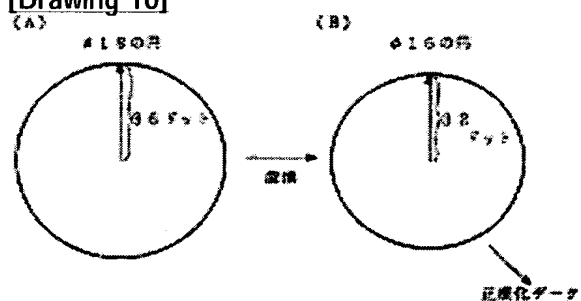


[Drawing 9]

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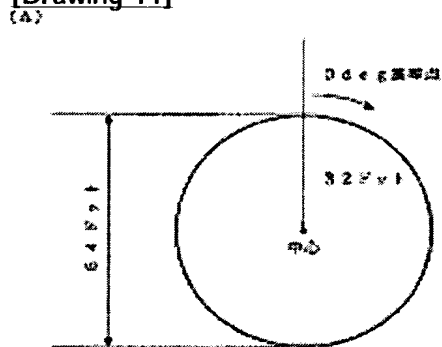
[Drawing 10]



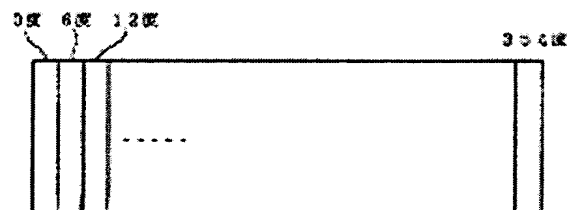
(C)

9 Fyt	9 Fyt	9 Fyt	9 Fyt	36 Fyt
8 Fyt	8 Fyt	8 Fyt	8 Fyt	32 Fyt

[Drawing 11]

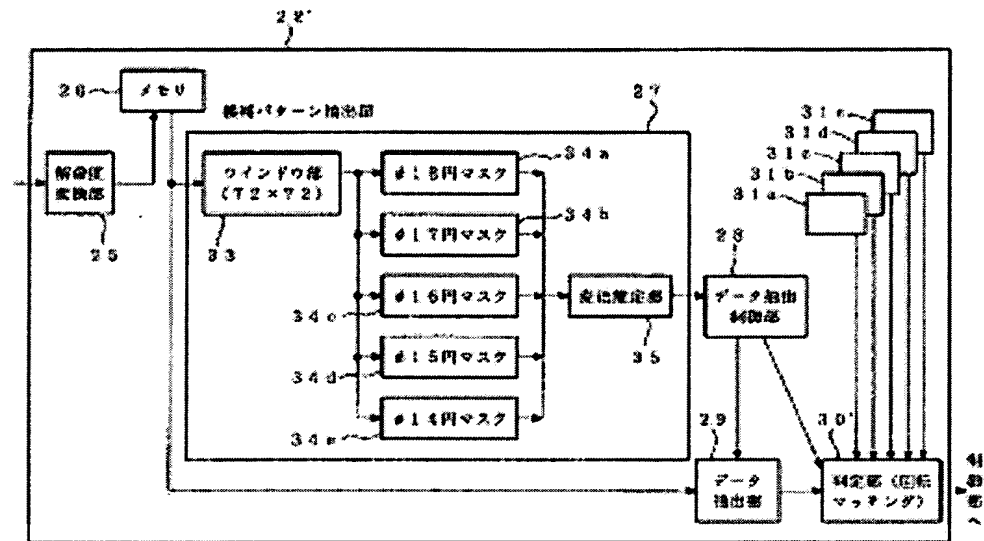


(B)



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[Drawing 12]



[Translation done.]

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